CLAIMS

1. Foamed polycrystalline silicon which has bubbles therein and an apparent density of 2.20 g/cm^3 or less.

2. The foamed polycrystalline silicon of claim 1 which is in the form of an assembly of independent grains or an agglomerate of independent grains.

3. The foamed polycrystalline silicon of claim 2, wherein the assembly of independent grains contains independent grains each having a weight of 0.2 to 2 g in an amount of 50 g or more based on 100 g.

4. The foamed polycrystalline silicon of claim 2, wherein the assembly of independent grains is formed by breaking up the agglomeration of an agglomerate of independent grains.

5. The foamed polycrystalline silicon of claim 1, wherein a plurality of independent bubbles are contained and are existent in a center portion of a grain.

6. A crushed product of the foamed polycrystalline silicon of claim 1.

7. The crushed product of claim 6 which has an average grain diameter of more than 200 μm and 5 mm or less.

8. A method of producing foamed polycrystalline silicon comprising naturally dropping droplets of silicon containing hydrogen which has been molten in the presence of hydrogen in 0.2 to 3 seconds and cooling the droplets until hydrogen bubbles are locked up in the droplets.

9. The method of claim 8, wherein natural dropping is carried out for 0.2 to 2 seconds.

10. The method of claim 8, wherein a silicon deposition reaction between hydrogen and a chlorosilane and a reaction for melting the deposited silicon in the presence of hydrogen are carried out simultaneously to prepare silicon droplets containing the hydrogen.

11. A polycrystalline silicon production apparatus comprising:

(a) a cylindrical vessel having an opening which is a silicon take-out port at the lower end;

(b) a heater for heating the inner wall from the lower end to a desired height of the cylindrical vessel at a temperature equal to or higher than the melting point of silicon;

(c) a chlorosilane feed pipe which is composed of an inner pipe having a smaller outer diameter than the inner diameter of the cylindrical vessel and constituted such that one opening of the inner pipe faces down in a space surrounded by the inner wall heated at a temperature equal to or higher than the melting point of silicon; and

(d) a first seal gas feed pipe for supplying seal gas into a space defined by the inner wall of the cylindrical vessel and the outer wall of the chlorosilane feed pipe.

12. The apparatus of claim 11 which further comprises (e) a hydrogen gas feed pipe for supplying hydrogen gas into the above cylindrical vessel.

13. The apparatus of claim 11, wherein a cooling acceptor for receiving droplets falling from the lower end of the cylindrical vessel is disposed in a lower portion of the

cylindrical vessel with a space therebetween.

14. The polycrystalline silicon production apparatus of any one of claims 11 to 13 further comprising a closed vessel which covers at least a lower end portion of the cylindrical vessel, forms a space in the lower portion of the cylindrical vessel and is provided with an exhaust gas discharge pipe, and a second seal gas feed pipe for supplying seal gas into a space defined by the outer wall of the cylindrical vessel and the inner wall of the closed vessel.